

What is claimed is:

1. A method of plasma etching a layer of oxide within a chamber comprising:
supplying a gas mixture containing a fluorocarbon gas and a fluorohydrocarbon gas to the chamber;
igniting a high-density plasma within the chamber by coupling RF energy to the gas mixture; and
etching said oxide.
2. The method of claim 1 wherein the fluorocarbon gas within said plasma source gas is selected from a group of gases containing CF_4 , C_4F_6 , and C_4F_8 .
3. The method of claim 1 wherein the fluorohydrocarbon gas within said plasma source gas is selected from a group of gases containing CHF_3 , CH_2F_2 and CH_3F .
4. The method of claim 1 wherein the gas mixture comprises 30 to 100 sccm of CF_4 , and 6 to 200 sccm of CH_2F_2 .
5. The method of claim 1 wherein said igniting step comprises the step of applying a bias power to a cathode electrode of 200 to 500 watts.
6. The method of claim 1 wherein said igniting step comprises the step of applying an inductive source power to an antenna of 400 to 1500 watts.
7. The method of claim 1 wherein a chamber pressure is between 4 to 60 mTorr.
8. The method of claim 1 wherein, during the etching step, a pedestal that supports the layer of oxide within the chamber is maintained at a temperature between 0 and 100 degrees Celsius.
9. The method of claim 1 wherein said oxide layer is covered in part by a photoresist layer and the etching step provides a selectivity of oxide to photoresist that is greater than 300:1.

10. The method of claim 1 wherein said high-density plasma has a plasma density greater than 10^{11} cm^3 .
11. The method of claim 1 wherein the gas mixture comprises CF_4 and CH_2F_2 in a $\text{CF}_4:\text{CH}_2\text{F}_2$ ratio of 1:1.5.
12. The method of claim 1 wherein the gas mixture comprises CF_4 and CH_2F_2 and adjusting the ratio of $\text{CF}_4:\text{CH}_2\text{F}_2$ controls a selectivity of oxide over photoresist.
13. A method of plasma etching a layer of oxide comprising:
supplying a gas mixture containing CF_4 and CH_2F_2 to a chamber;
igniting a plasma within the chamber by applying a bias power to a cathode electrode of about 500 watts and by applying an inductive source power to an inductively coupled antenna of about 700 watts; and
etching said oxide. ✓
14. The method of claim 13 wherein a gas pressure within the chamber is between 4 to 60 mTorr.
15. The method of claim 13 wherein, during the etching step, a pedestal that supports the layer of oxide within the chamber is maintained at a temperature between 0 and 100 degrees Celsius.
16. The method of claim 13 wherein said high-density plasma has a plasma density greater than 10^{11} cm^3 .
17. The method of claim 13 wherein the gas mixture comprises CF_4 and CH_2F_2 in a $\text{CF}_4:\text{CH}_2\text{F}_2$ ratio of 1:1.5.
18. The method of claim 13 wherein the gas mixture comprises CF_4 and CH_2F_2 and adjusting the ratio of $\text{CF}_4:\text{CH}_2\text{F}_2$ controls a selectivity of oxide over photoresist.
19. The method of claim 13 wherein the gas mixture further comprises HeO_2 .